QUINN EMANUEL
URQUHART & SULLIVAN, LLP
Peter J. Armenio
Matthew D. Robson
Seung Woo Hur
51 Madison Avenue, 22nd Floor
New York, New York 10010
Telephone: (212) 849-7000
Facsimile: (212) 849-7100

QUINN EMANUEL
URQUHART & SULLIVAN, LLP
Michelle A. Clark
50 California Street, 22nd Floor
San Francisco, California 94111
Telephone: (415) 875-6600
Facsimile: (415) 875-6700

QUINN EMANUEL
URQUHART & SULLIVAN, LLP
Miles D. Freeman
865 S. Figueroa Street, 10th Floor
Los Angeles, California 90017
Telephone: (213) 443-3000
Facsimile: (213) 443-3100

Attorneys for Defendant InAuth, Inc.

UNITED STATES DISTRICT COURT

CENTRAL DISTRICT OF CALIFORNIA

mSIGNIA, Inc.

Plaintiff,

vs.

InAuth, Inc.

Defendant.

Case No. 8:17-cv-01289-AG-KES

STATEMENT OF UNCONTROVERTED FACTS AND CONCLUSIONS OF LAW IN SUPPORT OF INAUTH, INC.'S MOTION FOR SUMMARY JUDGMENT OF NON-INFRINGEMENT

Redacted Version of Document Sought to be Sealed

Pursuant to Local Civil Rule 56-1, and Rule 56 of the Federal Rules of Civil Procedure, Defendant InAuth, Inc. ("InAuth") respectfully submits this Statement of Uncontroverted Facts and Conclusions of Law in support of its Motion for Summary Judgment of Non-Infringement. This Statement is supported by Exhibits A-Q attached to the Declaration of Matthew Robson in Support of InAuth's Motion for Summary Judgment of Non-Infringement and listed in a table below. Following the table are numbered paragraphs listing material facts.

Exhibit	Description
A	U.S. Patent No. 9,559,852 (mSIGNIA0000001-33)
B	Excerpts from mSIGNIA's Amended Infringement Contentions (S.P.R. 2.1)
C	September 26, 2018 Email from Mr. Thomas King to Mr. Matthew Robson
D	Opening Expert Report of Michael T. Goodrich, Ph.D. regarding Infringement and Practice of U.S. Patent No. 9,559,852
E	Excerpts from the Transcript of the October 26, 2018 deposition of Michael T. Goodrich, Ph.D.
F	Rebuttal Expert Report and Declaration of Dr. Patrick Traynor regarding Non-Infringement of U.S. Patent No. 9,559,852
G	Excerpts from the Transcript of the October 24, 2018 deposition of Patrick Traynor, Ph.D.
H	Excerpts from the Transcript of the September 12, 2018 deposition of Bashar Abdul-Jawad
I	Excerpts from the Transcript of the September 14, 2018 deposition of Glenn Benson
J	Excerpts from the Transcript of the September 11, 2018 deposition of Paul Marsolan
K	Excerpts from the Transcript of the March 29, 2018 deposition of Charles Crupper
L	Excerpts from the Transcript of the September 5, 2018 deposition of George Tuvell
M	June 28, 2017 Email from Mr. Paul Marsolan to Mr. Charles Crupper (IA01_00005353-54)
N	"V3 Algorithm" dated December 6, 2016 (IA01_00005669-75)

O	Excerpts from the Transcript of the October 30, 3018 deposition of Andrew J. Santaniello
P	January 9, 2018 Email from Mr. Jason Lao to Mr. Miles Freeman
Q	A screenshot of a portion of the v3 Target Table (IA01_00006204)

I. mSIGNIA's Complaint

A. This Court has subject matter jurisdiction over mSIGNIA, Inc.'s ("mSIGNIA" or "Plaintiff") claims of alleged patent infringement by InAuth pursuant to 28 U.S.C. §§ 1331 and 1338(a). (Dkt. 1 at ¶ 9).

B. Defendant InAuth is a Delaware Corporation with a place of business at 227 Broadway, Suite 200, Santa Monica, CA 90401. (Dkt. 1 at ¶ 7).

C. Plaintiff mSIGNIA is a California corporation, with its principal office located at 109 Holiday Court, Suite D7, Franklin, TN 37067. (Dkt. 1 at ¶ 6).

D. mSIGNIA alleges that InAuth directly infringes one or more claims of U.S. Patent No. 9,559,852 ("'852 patent"). (Dkt. 1 at ¶¶ 22-29).

E. The '852 patent is the only patent that mSIGNIA asserts against InAuth in this litigation. (Dkt. 1 at ¶ 4).

F. mSIGNIA's Complaint does not contain any allegation that InAuth willfully infringed or infringes any claim of the '852 patent. (Dkt. 1 at ¶¶ 22-29).

G. mSIGNIA's Complaint does not contain any allegation that InAuth indirectly infringed or infringes any claim of the '852 patent. (Dkt. 1 at ¶¶ 22-29).

II. U.S. Patent No. 9,559,852

1. '852 patent is a patent that on its face shows an issue date of January 31, 2017 and a filing date of March 18, 2016.

2. The named inventors of the '852 patent are Paul Timothy Miller ("Mr. Miller") and George Allen Tuvell ("Mr. Tuvell"). (Ex. A at mSIGNIA0000001).

3. mSIGNIA, Inc. ("mSIGNIA" or "Plaintiff") is named as the assignee of the '852 patent. (Ex. A at mSIGNIA0000001).

III. Testimony of Named Inventor Mr. George Tuvell

4. Mr. Tuvell testified that in the system he and his co-inventor invented, anticipated changes are particular to an individual user. (Ex. L, Transcript of the September 5, 2018 deposition of George Tuvell ("Tuvell Dep., Tr."), 67:3-10 ("Q. And this is true of the system that you and Mr. Miller invented as well, right, that the anticipated changes are particular to an individual user, right? [Attorney objection omitted] THE WITNESS: Yes."), 77:17-78:6).

5. Mr. Tuvell testified that one user having an anticipated change for a data value that is different from the anticipated change for another user goes to the heart of the digital biometric concept. (Ex. L, Tuvell Dep., Tr. 66:11-24 ("Q. So in the mSIGNIA system, one user may have a certain anticipated change for a data value that's different from the anticipated change for another user; is that right? A. Yes. Q. And this kind of – would you agree this really goes to the heart of the digital biometric concept? A. Yes. Q. Because you're try – mSIGNIA's system is trying to identify the types of changes that one user make and distinguish them from the types of changes that another user would make, right? A. Correct.")).

6. Mr. Tuvell testified that in the mSIGNIA system, stored with an identity are predictions for how data associated with that particular identity will change in the future. (Ex. L, Tuvell Dep., Tr. 71:5-10. ("Q. And so in the mSIGNIA system stored with Alice's identity's predictions for how her device is going to change in the future, and stored for Bob's identity's predictions for how Bob's specific device is going to change in the future as well? A. Correct.")).

IV. mSIGNIA's Infringement Allegations

7. On February 5, 2018, mSIGNIA served its First Amended Infringement Contentions (S.P.R. 2.1) on InAuth. (Ex. B at 1).

8. The first sentence of mSIGNIA's First Amended Infringement Contentions under the heading "Accused Instrumentalities (S.P.R. 2.1.2)" states as

follows: "The accused instrumentalities are the InAuth Security Platform and any products that use or are built on the InAuth Security Platform, including but not limited to InMobile, InBrowser, InRisk, InAuthenticate, InExchange, InReach, and InPermID." (Ex. B at 1).

9. Under the heading "Accused Instrumentalities (S.P.R. 2.1.2)" mSIGNIA further states that: "The accused functionalities within these accused instrumentalities include (1) InAuth's Version 3 Browser Fingerprinting functionality ('V3'); InAuth's 'Device Similarity Index' (or 'Device Similarity Print') functionality; and (3) selected ones of InAuth's Risk Rules for mobile devices, including the rules pertaining to changes in battery status and level, changes in accelerometer status, and checking Operating System Version Consistency ('Selected Risk Rules')." (Ex. B at 1).

10. On September 26, 2018, the day before mSIGNIA's opening expert report on infringement was due, mSIGNIA counsel sent to InAuth counsel an email stating in part that "After due consideration, mSIGNIA has elected to move forward to trial on its infringement claims relative to the V3 functionality only." (Ex. C, September 26, 2018 E-mail from Mr. Thomas King to Mr. Matthew Robson).

11. The September 26, 2018 email also informed InAuth that the claims that it asserts are 1-6, 13-15, 20, 22, 23, and 25. (Ex. C).

12. On September 27, 2018, mSIGNIA served a report titled "Opening Expert Report of Michael T. Goodrich, Ph.D. regarding Infringement and Practice of U.S. Patent No. 9,559,852" (Ex. D, "Goodrich Opening Report").

13. In the Goodrich Opening Report, Dr. Goodrich opines that InAuth's v3 InBrowser infringed claims 1-6, 13-15, 20-23, and 25 ("Asserted Claims") of the '852 patent. (Ex. D, Goodrich Opening Report at ¶ 1).

14. Dr. Goodrich does not present any opinion that InAuth indirectly infringes any Asserted Claim. (Ex. E, Goodrich Dep., Tr. 282:3-5).

15. Dr. Goodrich does not present any infringement opinions based on the doctrine of equivalence. (Ex. E, Goodrich Dep., Tr. 281:22-282:2).

16. Dr. Patrick Traynor, InAuth's technical expert, has opined that the accused products do not infringe under the doctrine of equivalents. (Ex. F, Rebuttal Expert Report and Declaration of Dr. Patrick Traynor regarding Non-Infringement of U.S. Patent No. 9,559,852 ("Traynor Rebuttal Report") at ¶¶ 229, 245, 255, 267, 271, 285, 291).

17. Dr. Traynor has opined that Dr. Goodrich has not shown "that InAuth's customers make or use the patented invention or that InAuth provides any instruction or guidance for doing so." (Ex. F, Traynor Rebuttal Report at ¶ 298).

V. Asserted Claims of the '852 Patent

18. Claim 1 of the '852 patent recites:

> 1. An identity recognition system comprising:
>
> a non-transitory memory storing information associated with one or more identities, wherein the information stored for an identity includes
>
> (a) data values associated with that identity; and
>
> (b) information regarding anticipated changes to one or more of the stored data values associated with that identity;
>
> one or more hardware processors in communication with the memory and configured to execute instructions to cause the identity recognition system to recognize that the presentation of identity information by a computer is authentic, by performing operations comprising:
>
> generating a challenge to the computer, wherein the challenge prompts the computer to provide a response based on one or more data values from the computer that correspond to one or more of the stored data values associated with the identity;
>
> receiving, from the computer, the response to the challenge;
>
> determining whether the response is allowable, wherein such determining comprises using the stored information regarding anticipated changes to the stored data values associated with the identity to determine whether a data

> value used to form the response is based on an acceptable change to a corresponding stored data value; and
>
> recognizing that the presentation of identity information by the computer is authentic, according to whether the computer has provided an allowable response to the challenge.

19. Claim 2 of the ’852 patent recites:

> 2. The identity recognition system of claim 1, wherein the identity is associated with the computer and is a user identity or a device identity.

20. Claim 3 of the ’852 patent recites:

> 3. The identity recognition system of claim 1, wherein the challenge prompts a response based on one or more user minutia data values.

21. Claim 4 of the ’852 patent recites:

> 4. The identity recognition system of claim 3, wherein the operation of determining whether the response is allowable includes evaluating whether at least a portion of the response is based on one or more acceptable changes to a user minutia data value.

22. Claim 5 of the ’852 patent recites:

> 5. The identity recognition system of claim 4, wherein the user minutia data values used to determine whether the response is allowable comprise user secrets, user customization, entertainment data, bio-metric data, or contacts.

23. Claim 6 of the ’852 patent recites:

> 6. The identity recognition system of claim 4, wherein the user minutia data values used to determine whether the response is allowable comprise calling app data, geo-location data, frequently called phone numbers, email, or network connection data.

24. Claim 13 of the ’852 patent recites:

> 13. The identity recognition system of claim 1, further comprising the operations of:
>
> in response to determining that the response is based on an acceptable change to a data value associated with the identity, updating the memory to reflect the changed data value.

25. Claim 14 of the ’852 patent recites:

> 14. The identity recognition system of claim 1, wherein the operation of determining whether the response is allowable further comprises comparing the received response to a member of a set of two or more allowable responses.

26. Claim 15 of the '852 patent recites:

> 15. The identity recognition system of claim 14, wherein the set of allowable responses is computed before the determining operation is performed.

27. Claim 20 of the '852 patent recites:

> 20. The identity recognition system of claim 1, wherein the operation of recognizing that the presentation of identity information by the computer is authentic provides a basis for one or more of: authenticating a device, authenticating a user, validating a software program or an application, providing data protection of data transmitted to or from a device, or generating a digital signature of a message digest.

28. Claim 21 of the '852 patent recites:

> 21. The identity recognition system of claim 1, wherein the response does not contain any data values reflecting personally identifiable information.

29. Claim 22 of the '852 patent recites:

> 22. The system of claim 1, further comprising using information from the allowable response to update the stored information regarding anticipated changes to the stored data values associated with the identity.

30. Claim 23 of the '852 patent recites:

> 23. The system of claim 1, further comprising using information from the allowable response to update the corresponding stored data value and the stored information regarding anticipated changes to the stored data values associated with the identity.

31. Claim 25 of the '852 patent recites:

> 25. An identity recognition system comprising:
>
> a non-transitory memory storing information associated with one or more identities, wherein the information stored for an identity includes (a) data values associated with that identity; and (b) information regarding anticipated changes to one or more of the stored data values associated with that identity;
>
> one or more hardware processors in communication with the memory and configured to execute instructions to cause the identity recognition system to recognize that the presentation by a first computer of an identity claim is authentic, by performing operations comprising:
>
> generating a challenge, wherein the challenge originates at a second computer distinct from the first computer and prompts

the first computer to transmit an identity claim comprising identity information;

receiving, from the first computer, a communication comprising the identity claim comprising identity information, wherein the identity claim is based on one or more data values from the first computer, and wherein at least one of the data values upon which the communication is based corresponds to a stored data value for the identity;

determining whether the communication received from the first computer is sufficient to recognize that the identity claim is allowable, wherein such determining comprises using the stored information regarding anticipated changes to the stored data values to determine whether a data value upon which the communication is based reflects an acceptable change to a corresponding stored data value associated with the identity; and

recognizing that the presentation of identity information by the first computer is authentic, according to whether the first computer has provided an allowable identity claim in response to the challenge.

VI. Claim Construction Hearing

32. During the June 6, 2018 Claim Construction Hearing, mSIGNIA's counsel stated the following:

> THE COURT: Okay. So we're going to switch over to defense to close. One last question for the plaintiffs.
>
> Would you agree that the plain meaning of the first term excludes solely evaluating changes after they occur?
>
> MR. KING: Your Honor, the phrase at issue probably excludes it, but the real reason that is excluded is because of the storing limitation. If you look at the claims, information about anticipated changes has to be stored. That storage happens before the challenge response. So that storage claim element is what bakes that into the claims. It's not necessary to – it's not just baked into the claims because of the word anticipated. It's locked solidly into the claims by the word stored.

Dkt. 44 (Transcript of Claim Construction Hearing, June 6, 2018) at 17:21-18:8.

VII. The V3 Beta Test

33. InAuth beta-tested a product called V3 InBrowser (also called "V3 prototype" or "V3") in May and June of 2017 with three InAuth customers. (Ex. D, Goodrich Opening Report at ¶¶ 99-101; Ex. F, Traynor Rebuttal Report at ¶ 80; Ex. I, Transcript of the September 14, 2018 deposition of Glenn Benson ("Benson,

Tr."), 141:18-25; Ex. H, Transcript of the September 12, 2018 deposition of Bashar Abdul-Jawad ("Abdul-Jawad Dep., Tr."), 53:7-13, 59:23-60:10).

34. Paul Marsolan is InAuth's Chief Technology Officer (CTO). (Ex. J, Transcript of the September 11, 2018 deposition of Paul Marsolan ("Marsolan Dep., Tr."), 25:2-3).

35. Regarding the V3 beta-test, Mr. Marsolan testified in part as follows: "at some point in time, we decided to move forward with the v3 ML strategy building that product set according to Glenn Benson's specs. We tested it on a small number of customers, and then it failed miserably, and then we turned it off and never ran it again." (Ex. J, Marsolan Dep., Tr. at 136:17-137:7).

36. Glenn Benson was InAuth's Chief Architect during the V3 beta test. (Ex. I, Benson Dep., Tr. 21:16-23).

37. Mr. Benson testified regarding V3 that "the amount of errors was more than was industry acceptable" and "it didn't work." (Ex. I, Benson, Tr. 137:12-25, 139:3-14 ("But the amount of errors was more than was industry acceptable."), 142:24-43:17 ("The algorithm did not have sufficient correctness or performance … [I]t didn't work.")).

38. Mr. Abdul-Jawad is InAuth's Server Team Lead and was so during the beta testing. (Ex. H, Abdul-Jawad Dep., Tr. 12:12-13:13).

39. Mr. Abdul-Jawad testified that "V3 could never be as fast as V2." (Ex. H, Abdul-Jawad, Tr. 134:11-135:21 ("V3 is fundamentally different. It looks at historical stuff. So V3 can never be as fast as V2. That's just impossible to accomplish.")).

40. Mr. Abdul-Jawad testified that what used to take "like three or four milliseconds" with V2 would take "hundreds of milliseconds" with V3, and "that was not accepted." (Ex. H, Abdul-Jawad Tr., at 122:9-123:3 ("[C]ustomers will have to wait until V3 is done before they get the response back from server. And what used to be like three or four milliseconds is now hundreds of milliseconds and

that was not accepted."); *see also id*. at 63:15-65:20 ("After we turned it off … [we] realized that the algorithm itself has exponential or logo rhythmic [*sic*: logarithmic] time complexity, so we turned it off because there's really no way you can make it fast. … [T]he more historical transactions you have to look at, the slower it's going to be. There was no way around that. And when the number of transactions grew large, the algorithm just got slower and slower. And the only way to make it fast is to limit how many transactions you want to look at, but that affected the algorithm correctness and accuracy…. There was no way to make it both. … [C]omparing a transaction with like millions of transactions before … that's not something you can do in … milliseconds, what is what our SLA was.")).

41. Mr. Adbul-Jawad testified as follows:

> Q. Can you explain why there was no way that you could make it run fast?
>
> A. Because the algorithm has – I think it's called full – time complexity, meaning that the more historical transactions you have to look at, the slower it's going to be. There was no way around that. And when the number of transactions grew large, the algorithm just got slower and slower.

(Ex. H, Abdul-Jawad Tr. at 63:25-64:14).

42. InAuth stopped the V3 beta test on or around June 28, 2018. (Ex. D, Goodrich Opening Report at ¶ 102; Ex. J, Marsolan Dep., Tr. 136:17-137:7 ("We tested it on a small number of customers, and then it failed miserably, and then we turned it off and never ran it again"), 215:3-11 ("V3 was not to be revisited. V3 is dead as an ML strategy."); Ex. I, Benson Dep., Tr. 66:1-9 ("the technology was never productized. ... This was something that was done in the lab and in betas. It never worked. So because it didn't work, we couldn't sell it to a customer."); Ex. M (IA01_00005353-54)).

43. During the beta-testing of V3, customers involved in the beta-testing continued to use V2 InBrowser. (Ex. E, Goodrich Dep. Tr., 170:9-19 ("Q. But V2 stayed on even during the beta testing of V3; right? A. That's my understanding.");

Ex. K, Transcript of the March 29, 2018 deposition of Charles Crupper ("Crupper Dep., Tr."), 284:15-18; Ex. F, Traynor Rebuttal Report at ¶¶ 203-204).

44. InAuth never sold V3 to any customer at any time. (Ex. I, Benson Dep., Tr. 66:1-9 ("the technology was never productized. ... This was something that was done in the lab and in betas. It never worked. So because it didn't work, we couldn't sell it to a customer."); Ex. K, Crupper Dep., Tr. 283:18-284:2 ("I'm not aware at any point in time of selling a V3 product to any customer"); Ex. O, Transcript of the October 30, 3018 deposition of Andrew J. Santaniello ("Santaniello Dep., Tr."), 14:9-16, 61:9-21, 62:19-63:6, 94:14-23, 95:15-22 ("But, again, v3 wasn't licensed, because it was never sold to any customers.")).

VIII. Technical Operation of V3

45. InAuth made the full source code base for V3 available for inspection by mSIGNIA as of January 4, 2018. (Ex. P).

46. The purpose of V3 was to assign an "InBrowserID," which is an identity associated with a browser. (Ex. D, Goodrich Opening Report at ¶¶ 54, 168 ("The purpose of V3 was to assign an 'InBrowserID,' which is an identity associated with the browser."); Ex. F, Traynor Rebuttal Report ¶ 83 ("V3 InBrowser was intended to receive information about a browser and return an InBrowserID for the browser."); Ex. I, Benson Dep., Tr. 74:13-75:11).

47. An InBrowserID is an identifier provided by InAuth to an InAuth customer, which can use the identifier in connection with the customer's authentication process to determine whether to allow the browser to engage in a transaction. *See, e.g.*, Ex. F, Traynor Rebuttal Report ¶ 67:

> InBrowser is a software tool that receives information about a transaction coming from a device (transacting using a web browser such as Internet Explorer) and provide information about the transaction and the browser. Among the information that InBrowser can provide is a browser identifier (i.e., a string of text or number) called an "InBrowserID." E.g., Benson, Tr. 31:15-19 ("InBrowser identified a browser … or produced a browser identifier."). An InBrowserID is intended to be a unique piece of text or number that can be use to identify (i.e., find or look-up) a browser in

> transactions. For example, once a customer of InAuth (e.g., an online bank) obtains an InBrowserID from the InBrowser software, it may use the InBrowserID in the bank's authentication process and determine whether a transaction should be allowed to proceed.

48. mSIGNIA has not identified any evidence that any InAuth customer has ever used a V3 InBrowserID to authenticate a user or transaction. *See, e.g.*, Ex. E, Goodrich Dep., Tr. at 188:8-12:

> Q. So you don't recall any evidence of a customer actually using the V3-generated browser ID to authenticate a user; right?
>
> A. As I sit here today, I'm not recalling any such evidence.

49. V3 received and stored attribute values from a browser. *See, e.g.*, Ex. D, Goodrich Opening Report ¶ 133:

> The Accused Products store the collected identity data on a server for use, including the recipe38 identity and data for the predictor attributes of V3. As explained above for element [1.1.1], the data is collected and stored on an InAuth server in a historical observation or transaction database for the V3 technology.

50. The V3 prototype used a database to store certain information associated with each InBrowserID. (Ex. D, Goodrich Opening Report ¶¶ 79, 119 ("The runtime java code references a historical database. This database contains all of the recipe38 values, and predictor field values[.]"); Ex. F, Traynor Rebuttal Report at ¶ 151 ("A specific InBrowser ID (representing an identity) was linked to and associated with the observed data values obtained from and stored for a particular browser.")).

51. Each InBrowserID was linked to and associated with the observed data values obtained from a particular browser when it accessed the system. (Ex. F, Traynor Rebuttal Report at ¶ 151 ("A specific InBrowser ID (representing an identity) was linked to and associated with the observed data values obtained from and stored for a particular browser."); Ex. D, Goodrich Opening Report at ¶ 79).

52. Specifically, the observed values of forty-four different attributes (e.g., observed fonts and IP address) were associated with each InBrowserID (i.e.,

identity). (Ex. F, Traynor Rebuttal Report at ¶¶ 151-53; Ex. D, Goodrich Opening Report at ¶¶ 78-80, 119 ("The V3 algorithm uses recipe38 and the data values collected as a result of recipe38 to represent the identity of a device's browser utilizing the system."), 126 ("In particular, InAuth's V3 functionality uses a database that stores historical information associated with one or more identities.")).

53. The V3 target table is not stored in the database containing InBrowserIDs and their associated data values. (Ex. F, Traynor Rebuttal Report at ¶ 156 ("Indeed, the V3 target table is not stored in the database containing the information stored in connection with each browser identity at all, rather [redacted]

54. The V3 target table is not associated with, connected to, or linked to in any manner any specific InBrowserID. (Ex. F, Traynor Rebuttal Report at ¶ 156 ("There is no 'associat[ion]' between the V3 target table an any particular identity – it is not linked to, connected to, or otherwise associated with any particular identity in the system.")).

55. V3 used stored attribute values of browsers to create, store, and provide InBrowserIDs. (Ex. D, Goodrich Opening Report at ¶¶ 79 n.46 ("'V3ID: The 3rd Generation device fingerprint solution produces the V3ID.'"), 168 ("The purpose of V3 was to assign an 'InBrowserID,' which is an identity associated with the browser.")).

56. If V3 identified a browser used in a transaction as a returning, previously identified browser, V3 returned an existing InBrowserID. (Ex. F, Traynor Rebuttal Report at ¶¶ 83 ("V3 InBrowser returns an existing InBrowserID if, in view of the received information about a browser and a device, the received information appears to be coming from a browser associated with an existing InBrowserID—i.e., if the received information appears to be belong to a returning, previously-identified browser."), 196; Ex. D, Goodrich Opening Report at ¶¶ 163

("The Accused Products use the target table predictions to determine whether the difference vector changes are a new or a returning device."), 168; Ex. E, Goodrich Dep., Tr. 215:5-11, 230:7-23, 276:17-23; Ex. I, Benson Dep., Tr. 74:13-75:11).

57. If V3 identified a browser used in a transaction as a new one not previously identified, V3 generated and returned a new InBrowserID. (Ex. F, Traynor Rebuttal Report at ¶¶ 83, 196; Ex. D, Goodrich Opening Report at ¶¶ 163, 168; Ex. E, Goodrich Dep., Tr. 215:5-11, 230:7-23 ("Q. Okay. And V3 looks at whether certain types of attributes are matched when others are mismatched to make this ultimate determination that's in the target row as to whether it's -- whether the browser is the same as a returning browser or previously identified browser; right? A. This is the nature of how the V3 algorithm does its anticipation."), 276:15-25 ("Q. So V3, it provides -- its output is -- let me back up. Is V3's output a browser ID? A. That's one of the things that it can produce that would be either a new one or an old one, or maybe a better way to say it is, like, either it accepts that this is a returning browser or that it's a new browser. Q. Does V3 provide a fingerprint? A. That's one way to think of it."); Ex. I, Benson Dep., Tr. 74:13-75:11).

58. In V3, a set of attribute values collected from a browser is called an "observation." (Ex. D, Goodrich Opening Report at ¶ 78 ("InAuth's Proof-of-Concept V3 technology collected twenty-three attributes for 'Recipe 38' (see IA01_00005669-70) and twenty-one attributes for 'Predictors' (see IA01_00005670) to identify a browser observation/transaction."); Ex. N at 69, 71 ("Consider two observations [attr1='a', attr2='b', attr3='100011'], and [attr1='a', attr2='X', attr3='100010']."); Ex. F, Traynor Rebuttal Report at ¶ 85 ("When a new observation of a device (i.e., a set of values of attributes) was received by V3 prototype, it would evaluate whether the observation is coming from a returning browser or a new browser.")).

59. Each historical observation stored in the database has an associated InBrowserID stored for it. (Ex. D, Goodrich Opening Report at ¶¶ 78, 79 ("'No

observations have a common deviceID with new.obs, so generate a new deviceID, and add to the observation history'"); Ex. F, Traynor Rebuttal Report at ¶ 82 ("An InBrowserID (also called 'V3ID' with respect to V3 InBrowser) is a randomly-generated string of text (and/or number) and is intended to be uniquely associated with a device (and its browser).")).

60. When V3 receives a new observation from a browser, V3 attempts to find a historical observation that matches all pertinent attributes exactly. (Ex. D, Goodrich Opening Report at ¶¶ 78, 79 ("Conversely, if a prior observation exists and the predictors for the recipe38 (together forming the 'V3ID' deviceID) exactly match the most recent observation, the timestamp for the observation is updated."); Ex. N at 69-70).

61. If such a historical observation that matches all pertinent attributes exactly is found, V3 retrieves from the database and returns an InBrowserID associated with the most recent of such a historical observation. (Ex. D, Goodrich Opening Report at ¶ 79 ("Conversely, if a prior observation exists and the predictors for the recipe38 (together forming the 'V3ID' deviceID) exactly match the most recent observation, the timestamp for the observation is updated."), ¶ 161 n.60 ("Second, if the recipe38 and the predictors exactly match a prior observation (i.e. there are no changes to the predictor attributes), the timestamp for the most recent prior observation is updated."); Ex. G, Traynor Dep., Tr. 284:2-14, 290:16-291:3, 296:19-297:6).

62. If certain attributes in a new observation (called Recipe 38 attributes) are the same as those of a historical observation but others (called predictor attributes) do not all match those of the historical observation, V3 computes a "difference vector." (Ex. D, Goodrich Opening Report at ¶¶ 80, 162; Ex. G, Traynor Dep., Tr. 284:2-14, 290:16-291:3, 296:19-297:6).

63. The difference vector is created by performing an attribute-by-attribute comparison of the predictor attributes in the new observation with those of the

historical observation. (Ex. D, Goodrich Opening Report at ¶¶ 80, 162; Ex. G, Traynor Dep., Tr. 284:2-14, 290:16-291:3, 296:19-297:6)

64. A difference vector is a list of 0's and 1's, where each entry (either a 0 or a 1) in the list indicates whether values for an attribute type (e.g., "x.inauth.geolocation.city") matched exactly ("0") or did not match exactly ("1") between the new observation and a historical observation. (Ex. D, Goodrich Opening Report at ¶¶ 71, 80 ("The difference vector represents changes in the predictor attributes between the browser observation to be identified and the historical observation. IA01_00005671 ('A difference vector is a vector of 0's and 1's depicting a boolean attribute-by-attribute match.'); id. ('the rule is that the attributes earn a 0 only if the observed values are exactly identical')."), 162, 179; Ex. F, Traynor Rebuttal Report at ¶ 88 ("A difference vector was a set of binary numbers (0 or 1), where each number in the vector indicates whether a certain attribute matched (0) or did not match (1)."); Ex. N at 70-71).

65. V3 then uses a table called the "target table" (Ex. Q, IA01_00006204) to determine whether the generated difference vector (between the new observation and a historical observation) indicates the browser is a new or returning browser. (Ex. D, Goodrich Opening Report at ¶¶ 81, 162 ("After receiving the response data values from the 'new observation' or transaction, the V3 algorithm computes a difference vector of predictor changes and looks up the difference vector in the target table. . . . 'The target vector is a prediction as to whether a particular diff[er]ence vector represents a returning browser or a new browser.'"), 179; Ex. F, Traynor Rebuttal Report at ¶ 89; Ex. N at 70-71).

66. The target table is a table that includes permutations of difference vectors. (Ex. D, Goodrich Opening Report at ¶ 81).

67. Each row of the target table includes a difference vector. (Ex. D, Goodrich Opening Report at ¶ 81; Ex. E, Goodrich Dep., Tr. 207:4-7 ("Q. But the target table, it's just a table; right? For each attribute, it simply has a 1 or a 0; right?

A. In each row, that's right."), 212:15-215:11; Ex. F, Traynor Rebuttal Report at ¶ 91)).

68. The last column ("target" column) of each row in the target table indicates whether the browser being analyzed, given its difference vector, should be determined to be a returning browser ("0") or a new browser ("1"). (Ex. D, Goodrich Opening Report at ¶ 163 ("If the target value for the particular difference vector is '0', the difference vector represents predictor value changes acceptable to identify a returning device. . . . When target value for a particular difference vector is '1', the difference vector represents predictor values changes that are not accepted as a returning device, but rather identify a new device."); Ex. E, Goodrich Dep. Tr., 215:5-11, 218:8-13, 229:7-230:15; Ex. F, Traynor Rebuttal Report at ¶¶ 89-91 ("In other words, each row in the target table indicates whether a certain difference vector (that reflects which attributes matched and which attributes did not match between two observations) should be considered as a comparison of two observations from the same browser (i.e., target column is a '0') or as a comparison of two observations from two different browsers (i.e., target column is a '1')."")).

69. Below is a screenshot of a portion of the target table, showing six rows (difference vectors) and the "target" value (0 or 1) for each difference vector:

[redacted]

(Ex. Q, IA01_00006204; Ex. E, Goodrich Dep. Tr. 203:23-204:20 ("Q. I think you characterize this as the full V3 target table with predictors and target vector; right? A. Yes.")).

70. The target table thus shows which attributes can mismatch ("1") when certain other attributes match ("0") and still be considered to be observations from the same browser. (Ex. E, Goodrich Dep., Tr. 230:1-6 ("Q. So the target table, each

row represents a permutation of which attributes can be mismatches when other -- when certain other attributes are a match in order to identify a browser; right? A. Yes.")). *See also* Ex. E, Goodrich Dep., Tr. at 214:9-215:4:

> Q. Okay. And so if that represents time.tz as an attribute -- and I'm thinking time zone -- that means that time.tz was not a match as compared to the last time zone that was logged; right?
>
> A. That's right.
>
> Q. Okay. Not a match. It doesn't proffer any prediction as to what time zone the user is supposed to be in, but it tells you the time zone was not a match from the last time; right?
>
> A. That's what that 1 indicates, yes.
>
> Q. Okay. And there are other mismatches here; right?
>
> A. Yes.
>
> Q. And those are indicated by the 1s; right?
>
> A. That's correct.
>
> Q. And there are data matches, and that's indicated by the 0s; right?
>
> A. Also correct, yes.

71. For example, row 31195 shows that even if attribute "x.inauth.geolocation.city" is a mismatch ("1") between the new observation and a historical observation (e.g., "New York City" versus "Beijing"), if certain other attributes are exact matches (e.g., flashFonts.list, shown as "0"), the new observation and the historical observation can be considered to be from the same browser (as shown by "0" in the "target" column). (Ex. E, Goodrich Dep., Tr. 212:15-216:4; Ex. F, Traynor Rebuttal Report at ¶¶ 89-95 ("[A] row in the target table is a target vector. . . . Each column, except for the right-most column named 'target,' corresponds to an attribute. For example, the first column is the attribute 'x.inauth.geolocation.city' and the second column is the attribute 'flashFonts.list.' 1 indicates that the values for the attribute does not match between

two observations (i.e., they are not equal), and 0 indicates that the values for the attributes does match between two observations (i.e., they are equal).")).

72. Based on the target table, V3 determines that compared observations are from the same browser by tolerating mismatches of certain attributes as long as certain other attributes match exactly:

> Q. [T]his vector allows certain attributes to be a mismatch as long as other specific attributes are a match. It will still return a 0; right?
>
> A. That's right.

Ex. E, Goodrich Dep., Tr. 218:8-219:2.

> Q. So the target table, each row represents a permutation of which attributes can be mismatches when other -- when certain other attributes are a match in order to identify a browser; right?
>
> A. Yes.
>
> Q. Okay. And V3 looks at whether certain types of attributes are matched when others are mismatched to make this ultimate determination that's in the target row as to whether it's -- whether the browser is the same as a returning browser or previously identified browser; right?
>
> A. This is the nature of how the V3 algorithm does its anticipation.

Id., 230:1-15; Ex. F, Traynor Rebuttal Report at ¶ 95 ("In sum, the V3 prototype operated by disregarding mismatches of certain data values of attributes as long as certain other attribute data values matched.").

73. The target table does not contain any prediction of how a particular browser attribute is going to change (e.g., from a value of 5 to a value of 6) over time. (Ex. E, Goodrich Dep., Tr. 209:23-210:5 ("[J]ust to be clear, the target table does not show whether or not a certain attribute that was a 5 is going to change to a 6, for example. It does not include that kind of information."), 206:2-207:3, 208:9-22, 216:5-217:1 ("So the prediction isn't of individual values changing from, like, a 5 to a 6. It's about how things happen in concert and in collections."), 214:9-215:4, 227:10-17 ("Q. So I just want to break this answer down. So we agree that the target table does not show how a particular attribute -- I think what you called it is an individual value, how that's going to change; right? A. That's right. How particular

values change to other values is not reflected in the target table."); Ex. F, Traynor Rebuttal Report at ¶ 183 ("As I discussed above (Section VIIII.A, *supra*), V3 does not create or store any predictions regarding changes to any data value.").

74. According to Dr. Goodrich, V3 does not contain any anticipation for individual data values, but rather, V3 determines whether a group of mismatches to certain attributes and matches of certain other attributes, when viewed in concert, indicates that the compared observations are from the same browser:

> So the prediction isn't of individual values changing from, like, a 5 to a 6. It's about how things happen in concert and in collections.

Ex. E, Goodrich Dep., Tr. 216:23-217:1.

> Q. Right. But there's no prediction about where I will be next time I log in built into the geolocation attribute, for example; right
>
> A. Other than the combinations of how things should also be matching or not matching with respect to the other attributes. That's the nature of how the target table works. It's all about things in concert, not individually.

Id., 225:11-20.

> So it's not the individual value changing, say, from New York to Beijing. That's not encompassed in the target table. Instead what's there is when you change the city, what other stuff stays the same and what other stuff can change and still be an acceptable change, and we allow this to, then, be considered the same browser.

Id., 226:20-217:17; Ex. F, Traynor Rebuttal Report at ¶¶ 94-95 ("In sum, the V3 prototype operated by disregarding mismatches of certain data values of attributes as long as certain other attribute data values matched.").

75. If, upon performing a look-up in the target table, V3 finds a historical observation that it determines to be from the same browser as the new observation, V3 returns the associated InBrowserID stored for the most recent of such a historical observation. (Ex. D, Goodrich Opening Report at ¶ 163; Ex. E, Goodrich Dep. Tr., 215:5-11; Ex. F, Traynor Rebuttal Report at ¶¶ 89-91, 176 ("As I have explained above (Section VIII, *supra*), V3 prototype involved comparing an observation of the current transaction to historical observations and returning an existing InBrowserID or a newly-generated InBrowserID.")).

76. If V3 does not find such a historical observation in the database corresponding to the new observation, V3 generates and returns a new InBrowserID. (Ex. F, Traynor Rebuttal Report at ¶ 98 ("If no difference vector between the observation of the current transaction and an observation previously-recorded . . . that has a target column value of 0 (i.e., considered to be observations of the same device) can be found after going through all previously-recorded observations to compare against, then . . . a new InBrowserId is randomly generated[.]"); Ex. E, Goodrich Dep., Tr. 276:17-23 ("Q. So V3, it provides -- its output is -- let me back up. Is V3's output a browser ID? A. That's one of the things that it can produce that would be either a new one or an old one, or maybe a better way to say it is, like, either it accepts that this is a returning browser or that it's a new browser. Q. Does V3 provide a fingerprint? A. That's one way to think of it.")).

77. In response to receipt of a browser fingerprint, the V3 system would always return to the customer an InBrowser ID for the browser (either a new one or one previously stored). (Ex. F, Traynor Rebuttal Report at ¶ 205).

78. V3 did not include functionality for determining that a received browser fingerprint was inauthentic and, therefore, decide not to return an InBrowserID to the client. (Ex. F, Traynor Rebuttal Report at ¶ 205; Ex. H, Abdul-Jawad, Tr. 114:6-19).

79. V3 had one common target table that was used for all of its operations. (Ex. E, Goodrich Dep., Tr. 199:1-15 ("Q. But there's not -- so when V3 is running like when it was running in beta, it used one target table; right? A. That's my understanding, yes."); Ex. H, Abdul-Jawad Dep., Tr. 71:12-72:1 ("Q. Was the same target vector file used for all customers? A. Yes. It's the same target vector file.")); Ex. F, Traynor Rebuttal Report at ¶¶ 157-58:

> Further, the V3 target table is a reference table that applies equally across all identities and is not specific to, customized for, or tailored to any particular identity in any manner. . . . The V3 target table is agnostic to the particular identity being analyzed and does not include any identity-specific information. . . .For ***every*** transaction, if needed, the ***same***, ***single*** target table

> was referenced in evaluating whether a transaction is coming from a returning device or a new device. As such, the target table (IA01_00006204) was not stored in a database for storing information associated with devices and their observations, but rather, the target table (in its encrypted form) was stored in a separate location.

80. The single target table applied commonly to all identities and was not individualized for any particular user.

> Q. There's one target table, and that target table is not individualized for any particular user; right?
>
> A. That's right. That's my understanding. And there's nothing in the claims that require that.

(Ex. E, Goodrich Dep., Tr. 202:9-203:9; Ex. F, Traynor Rebuttal Report at ¶¶ 157-58).

81. Dr. Goodrich testified as follows:

> Q. But there's not – so when V3 is running like when it was running in beta, it used one target table; right?
>
> A. That's my understanding, yes.

Ex. E, Goodrich Dep., Tr. 199:12-15.

> Q. Okay. We would agree that there's one single target table that applies to all identities; right?
>
> A. Yes. That's right.
>
> …
>
> Q. So there's no factual dispute to say whether a unique target table exists for each ID; right?
>
> A. That sounds right. That sounds right, as I sit here today.

Id. at 202:9-203:9.

82. The target table was generated before V3 stored any identity information, and was not developed using any historical data collected by V3. (Ex. E, Goodrich Dep., Tr. 190:20-191:3 ("Q. So there had to be a first target table in place for V3 to -- when it launched; right? A. Yes. Q. Right. And that first initial target table that was developed, that was not developed using historical data collected by V3 itself; right? A. Yeah, that's how time works."); Ex. D, Goodrich

Opening Report at ¶ 127 ("The V3 historical observation database begins empty but grows as the V3 system operates, i.e. as it encounters and stores device observations."); Ex. F, Traynor Rebuttal Report at ¶ 158 ("V3 prototype's single target table (IA01_00006204) was a table for the entire prototype system and was not stored for any identity or associated with any particular identities.")).

DATED: November 12, 2018

Respectfully submitted,

By */s/ Matthew Robson*
Matthew Robson